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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/542,638	01/13/2006	Anton Seelig	20800/0204884-US0	1734

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EXAMINER	
ROMAN, LUIS ENRIQUE	
ART UNIT	**PAPER NUMBER**
2836	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

T14

Office Action Summary	Application No.	Applicant(s)	
	10/542,638	SEELIG ET AL.	
	Examiner	Art Unit	
	LUIS ROMAN	2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *17-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *17-29* is/are rejected.

7)☒ Claim(s) *23* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 January 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *07/19/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 17-22 & 24-27 are rejected under 35 U.S.C. §103(a) as being unpatentable over Hirai et al. (US 5798622) in view of Jang et al. (US 6934167) and Jaenker (US 6231013).

Regarding claim 17 Hirai et al. discloses a non-contacting electric power transfer apparatus (Fig. 35) including at least one stationary (left side of vertical line defined by elements 362, 363, 363_2) and one moving part (right side of vertical line defined by elements 362, 363, 363_2), power being transmitted between the at least one stationary part and the at least one moving part (power from 361_1 and 364_1 thru element 362), the device comprising: an inductive transformer including a primary winding disposed on the stationary part and a secondary winding disposed on the moving part (362), the inductive transformer bridging an isolating point between the stationary part and the moving part (vertical line defined by elements 362, 363, 363_2); a frequency generator (361_2) and at least one actuator control element connected to the secondary winding (364_3) but does not specifically disclose having a series-resonant circuit capacitor connected to the primary winding and including a matrix arrangement of a plurality of switchable power semiconductors connected to the secondary winding; wherein at least portions of the inductive transformer, frequency generator and at least one actuator

control element are disposed in an area of a rotor shaft and a rotor head of a rotary-wing aircraft.

Jang et al. discloses a contactless electrical energy transmission system (Fig. 4) having a series-resonant circuit capacitor connected to the primary winding (C_p) and including a matrix arrangement of a plurality of switchable power semiconductors connected to the secondary winding (S_1, S_2, D_1, D_2).

Jaenker teaches rotor blades and actuators on a rotary-wing aircrafts (Abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Hirai et al. device with the Jang et al. teachings because it provides a simple contactless electrical energy transmission (CEET) solution with a highly regulated power transfer between the primary and the secondary sides and avoids harmful hard switching conditions (Col. 2 lines 31-34) and further with the teachings of Jaenker et al. because it use actuator systems which are compact, light in weight and not subject to a mechanical tilting displacement or jamming of the actuating components, since the actuating movement is generated from within the solid state bodies (Col. 3 lines 26-30).

Regarding claims 18-19 Jaenker further teaches the use of piezoelectric actuators in rotary-wing aircrafts (Abstract) and wherein the at least one capacitive actuator is disposed in at least one rotor blade of the rotary-wing aircraft (Col. 5 lines 43-50 & Fig. elements 31 & 34).

Regarding claims 20-21 Jang et al. further teaches switchable power semiconductors configured to form an output voltage and disposed in direction relative to the only one polarity of the output voltage (Fig. 4 elements S_1, S_2, D_1, D_2) but does not specifically disclose the use of unipolar or bipolar switches. The use of one type of switch and the other is determined by the device's performance desired depending on frequency and power requirements.

Regarding claims 24-27 Hirai et al. further discloses wherein the at least one primary winding is disposed on a stationary part of a rotor shaft bearing, and wherein the secondary winding is disposed on the rotor shaft and corresponds to the primary winding (Fig. 35 primary and secondary of element 362) and a sensor located at the shaft (Col. 3 lines 7-11 & Claim 1: Col. 33 lines 36-37). In addition Jaenker teaches the use of the actuators in rotor blades of helicopters which implicitly discloses a device aerodynamically effective and the control circuit is not in the static side (Fig. 35 elements 364_7 & 364_6).

Claims 22 & 28-29 are rejected under 35 U.S.C. §103(a) as being unpatentable over Hirai et al. (US 5798622) in view of Jang et al. (US 6934167), Jaenker (US 6231013) and Kurakawa et al. (JP 07-046864).

Regarding claim 22 Hirai et al. in view of Jang et al., and Jaenker discloses the device of claim 18 but does not specifically disclose wherein: the actuator control element includes a regulator and a controller configured to impress positive and negative half-waves or half-wave segments of a higher-frequency alternating current into the actuator, the regulator is connected the controller so as to form different-sized half-wave segments of the current using a magnitude signal as a function of a magnitude of the difference between a setpoint actuator voltage and an actual actuator voltage; the regulator is connected to the controller so as to control the power semiconductors using a polarity signal as a function of a polarity sign of the difference between the setpoint actuator voltage and the actual actuator voltage, in such a way that, when the polarity sign of the difference is negative, a successive charge or power is withdrawn from the actuator from one half-wave to the next and, when the polarity sign of the difference is positive, a successive charge or power is supplied to the actuator from one half-wave to the next.

Kurakawa et al. teaches a driver for piezoelectric actuator which detects when the error is positive/negative thru half-wave signals. In other words the

charging/discharging currents of the actuator are detected to provide output to the amplifiers and control the position of piezoelectric actuator (Abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Hirai et al. device in view of Jang et al., and Jaenker et al. with the teachings of Kurakawa et al. because it provides electrical isolation.

Regarding claims 28-29 Hirai et al. in view of Jang et al., Jaenker and Kurakawa et al. discloses a device (a person of the ordinary skill will understand a method that is intrinsically described by the functioning of the apparatus) providing power of at least one actuator (Hirai et al. Fig. 35) Jaenker discloses the actuators being piezoelectric (Abstract) wherein the at least one actuator is arranged on a moving part system that is separated from a stationary system by an isolating point (Hirai et al. Fig. 35), the method comprising: generating a higher-frequency alternating current from a direct voltage using a frequency generator disposed in the stationary system, the higher-frequency alternating current having an amplitude independent of a phase angle and of an amplitude of a reverse voltage (Hirai et al. Fig. 35 element 361_2); transmitting the alternating current from a primary winding of an inductive transformer that bridges the isolating point (Hirai et al. Fig. 35 element 361_1 to 364_1; thru element 362) separating the alternating current coming from a secondary winding of the inductive transformer in the moving part system into positive and negative half-waves or segments of these half-waves (Jung et al. Fig. 4 elements S_1, S_2, D_1, D_2) and always impressing the alternating current into the at least one actuator using an electronic control element in a direction such that a length change of the actuator occurs in a desired direction in each half-wave (Kurakawa et al. Abstract).

Allowable Subject Matter

Claim 23 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luis E. Román whose telephone number is (571) 272-5527. The examiner can normally be reached on Mon – Fri from 7:15 AM to 3:45 PM.
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Sherry can be reached on (571) 272-2084. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.
Information regarding the status of an application may be obtained from Patent Application Information Retrieval (PAIR) system.
Status information for unpublished applications is available through private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the private PAIR system, contact the Electronic Business Center (EBC) at (866) 217-9197 (toll-free).

LR/020308

/Luis Roman/
Examiner, Art Unit 2836

2/4/08

MICHAEL SHERRY
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800